

(No Model.)

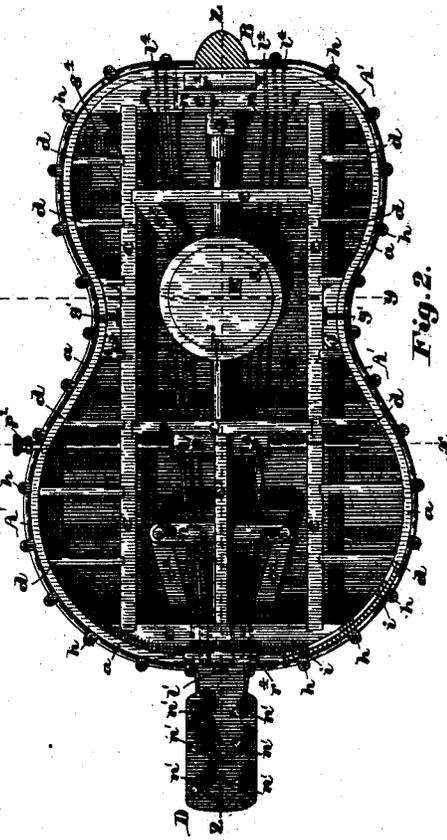
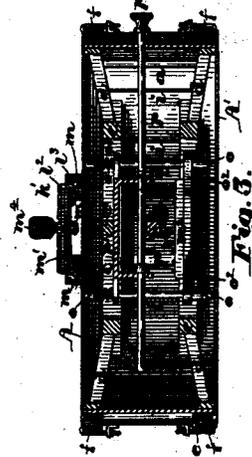
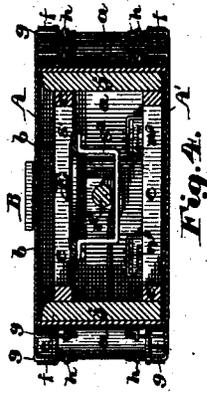
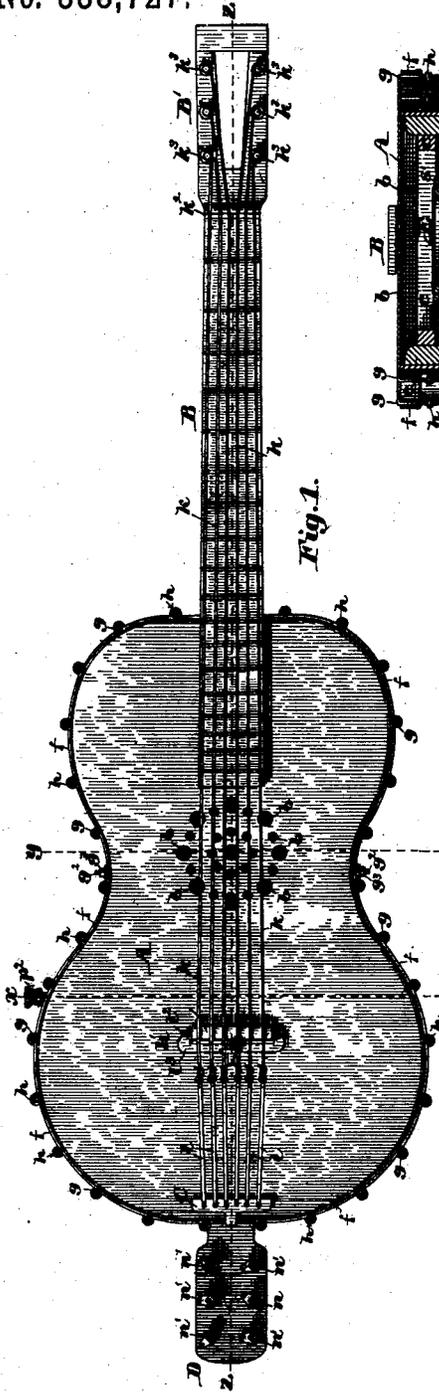
2 Sheets—Sheet 1.

R. F. FLEMMINGS, Jr.

GUITAR.

No. 338,727.

Patented Mar. 30, 1886.



Witnesses:

Walter E. Lombard—
Frank C. Gray.

Inventor:

Robert F. Flemmings, Jr.,

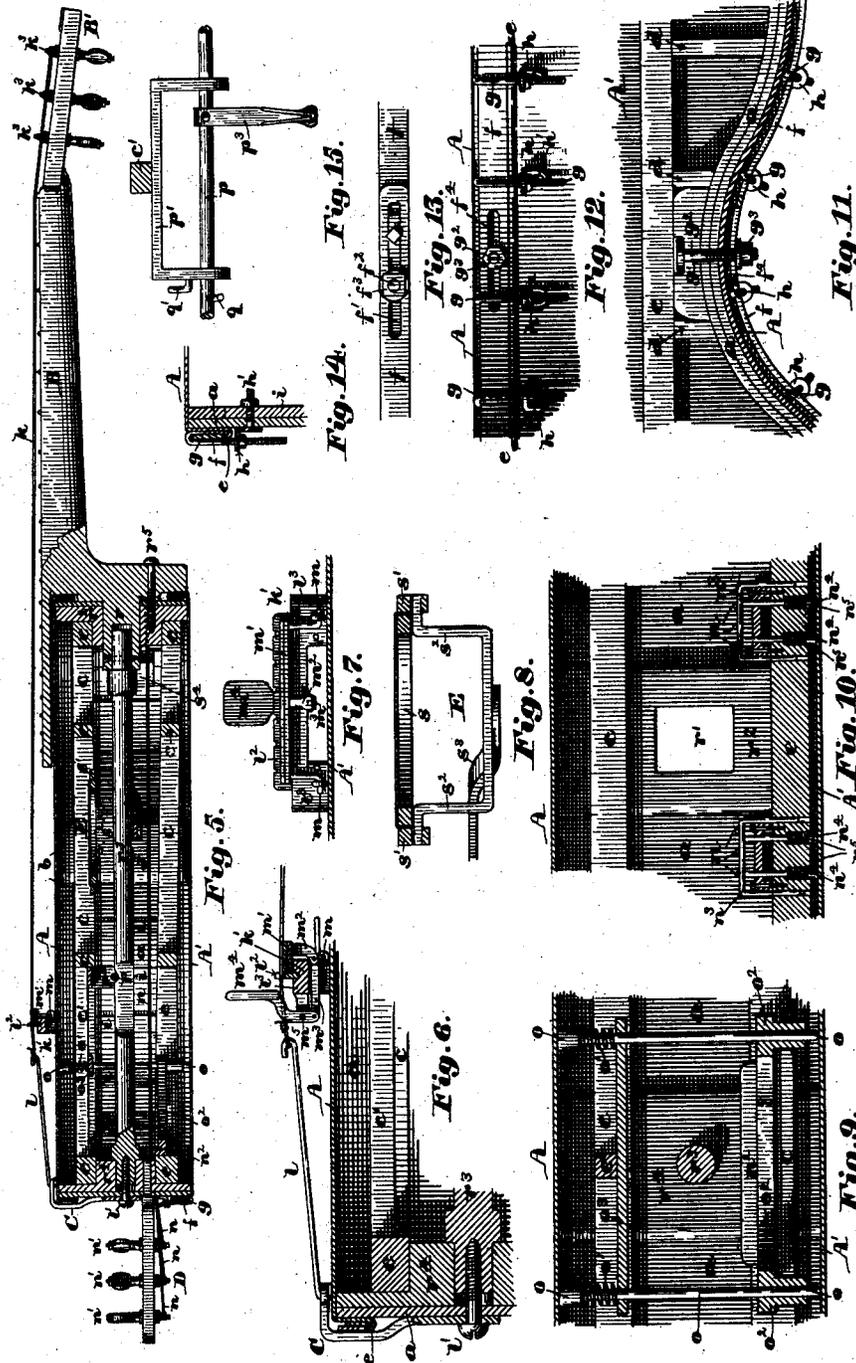
by N. C. Lombard
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 Attorney.

UNITED STATES PATENT OFFICE.

ROBERT F. FLEMMINGS, JR., OF MELROSE, MASSACHUSETTS, ASSIGNOR OF
ONE-FOURTH TO CHARLES L. SPRAGUE, OF SAME PLACE.

GUITAR.

SPECIFICATION forming part of Letters Patent No. 338,727, dated March 30, 1886.

Application filed September 5, 1885. Serial No. 176,236. (No model.)

To all whom it may concern:

Be it known that I, ROBERT F. FLEMMINGS, Jr., of Melrose, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Musical Instruments, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to musical instruments, and especially to that class of stringed instruments in which the strings are vibrated by the fingers; and it has for its object the production of an instrument which I term the "Euphonica," and which contains all of the good qualities of a guitar, while the volume and sweetness of its tone is much superior thereto, and at the same time it is much more sensitive to the touch.

My invention consists in certain novel features of construction and arrangements and combinations of parts, which will readily be understood by reference to the description of the drawings, and to the claims to be hereinafter given.

Of the drawings, Figure 1 represents a plan of a musical instrument embodying my invention. Fig. 2 represents a plan of the same with the upper vellum or parchment head removed and the neck broken away. Fig. 3 represents a cross-sectional elevation of the same, the cutting-plane being on line *xx* on Figs. 1 and 2. Fig. 4 represents another cross-sectional elevation of the same, the cutting-plane being on line *yy* on Figs. 1 and 2. Fig. 5 represents a longitudinal sectional elevation of the same, the cutting-plane being on line *zz* on Figs. 1 and 2. Fig. 6 represents a longitudinal sectional elevation of a portion of one end of the body of the instrument, the cutting-plane being on line *zz* on Figs. 1 and 2. Fig. 7 represents a front elevation of the bridge and damper; and Figs. 8 to 15, inclusive, represent details of construction, which will be hereinafter referred to. Figs. 6 to 15, inclusive, are all drawn to an enlarged scale.

The body of my improved instrument is made of substantially the same shape as an ordinary guitar, and has similar wooden sides *aa*; but instead of having wooden heads, as in a guitar, it is provided with parchment or

vellum heads *AA'*, which are stretched over said sides in any well-known manner. The upper vellum head, *A*, is provided, at or near the point where the strings are vibrated by the fingers, with a number of perforations, *bb*, through which the sound may escape.

In order to prevent the destruction of the sides *aa* by a too severe straining of the vellum heads *AA'*, said sides are strengthened by the interior bracing, *cc*, which, together with the additional short braces *dd*, are placed far enough from the inner sides of the heads *AA'* to prevent the possibility of their contact therewith.

The heads *AA'* are stretched upon the body of the instrument by being cut to a shape similar to but somewhat larger than the outline of said body, and then having the surplus material bent back upon itself over a wire, *e*, which is slipped over each of said heads after they have been placed upon the body of the instrument, after which a band of metal, *f*, is placed over each of said heads, so that one edge thereof comes into contact with that portion of the vellum or parchment head which has been turned back upon itself over the wire *e*, and then the said band *f* is forced downward by the pull-downs *gg*, having bearings in the brackets *hh*, which are secured to the sides or shell *aa* of the body of the instrument by means of the screws *h'h'*, passing through said shell *a*, and provided with suitable nuts upon the interior, as shown in Fig. 14. At the points where the brackets *hh* are thus secured to the sides *aa* said sides are reinforced and strengthened by the narrow ribs *ii*, made of wood, the grain of which is at right angles with the grain of the band of wood which forms the shell or sides *aa* of said body of the instrument.

The metal band *f* is formed of a narrow ribbon of metal, in which a slot, *f'*, is formed at one end, while the other end is provided with a suitable threaded stud or bolt, *f''*, which passes through said slot *f'* when said ends are caused to overlap, and is provided with a clamping-nut, *f'''*, by which the said ends may be clamped together in any desired position, so as to insure that said band will fit snugly the perimeter of said shell or sides *aa*.

At the narrowest part or waist of the body

of the instrument, at which point the greatest strain is brought to bear upon the sides or shell *a a*, said sides are re-enforced by the stiffening-pieces *j j*, which are provided at either end with suitable slots, *g' g'*, in which are placed the bolts *g''*, the threaded ends of which extend outside of the body of the instrument through the slots *f'* in the metal band *f*, and are provided with the nuts *g''*, by which the band *f* is made to conform to the outline of the said waist of the body of the instrument.

To the lower end of the body of the instrument is secured the tail-piece C, made of thin sheet metal, and provided with a series of hooked wires, *l l*, with each of which is connected a string, *k*, by means of a suitable loop formed in the end thereof, said string passing over the movable bridge *k'* and fixed bridge *k''*, mounted, respectively, upon the vellum head A and the neck B, and over which it is strained by the tuning-peg *k''*, mounted in the head B', and to which the other end of the string is secured.

The tail-piece C is secured to the lower end of the body of the instrument by the screw *l'*, and its upper end, which is provided with said hooks *l l*, is bent over so that it is slightly above and parallel to the vellum head A.

The hooks with which the wires *l l* are provided form a most convenient and ready means of stringing the instrument, the advantages of which are obvious.

The bridge *k'* is composed of a metal strip, *z*, mounted upon a wooden base portion, *z'*, to which is pivoted, at *m m*, a damper or mute, *m'*, which has its upper surface provided with a covering of leather or similar material, and which is provided on its under side with an arm, *m''*, to which is pivoted the link *m'''*, the opposite end of which link is pivoted to the lever *m''*, having a fulcrum at *m''*, and by which the damper *m'* may be readily operated to come into contact with the strings *k k* and modify their tone by softening or deadening the same, all as shown in Figs. 6 and 7; or by depressing the lever *m''* the damper *m'* will be forced from contact with the strings *k k*, and thus allow them to vibrate with a full tone.

Within the body of the instrument, and nearer to the lower vellum or parchment head thereof, are placed an additional series of strings, *n n*, which are of the same kind and quality as those outside, and are secured at the upper end of the body of the instrument by passing their ends through holes made in said end, and having pins *l' l'* passing through loops formed in said strings to prevent said strings from being drawn backward through said holes, or the ends of said strings may be secured to said end in any other well-known manner. The opposite ends of said strings *n n* pass through suitable openings in the lower end of said body, and are secured to the pegs *n' n'*, mounted in the arm D, set in and projecting from said lower end, and by which pegs *n' n'* the strings *n n* may be tuned into perfect unison with the strings *k k*, located

outside of said body, said strings *n n* being stretched over the fixed bridge *n''* and the vertically-moving bridges *n'' n''*, mounted upon the bracing *c c* at the lower and upper ends of the body, respectively.

The bridges *n'' n''* are made of an inverted-U-shaped form, and have bearings for their parallel arms in the lower cross-brace, *c*, at the upper end of the body of the instrument, all as shown in Fig. 10. Beneath the central portion of these bridges *n'' n''* are placed one or more rods, *n' n'*, which are pressed by the springs *n'' n''* firmly against the lower vellum head, A', while said bridges *n'' n''* are firmly pressed against the opposite ends of said rods by the tension of the strings *n n*, so that the said strings *n n* will be caused to vibrate with the head A' in an obvious manner.

In order to insure that the lower head, A', may readily respond to any vibration of the upper vellum head, A, the posts *o o* are provided, which are interposed between said heads A A', and which are of a length such that the ends thereof are in contact with the heads A A', so that any vibration of the upper head, A, will be transmitted through said posts to the lower vellum head, A', this result being materially assisted by the springs *o' o'*, which tend to keep the upper ends of said posts continually in contact with the under side of the upper vellum head, A, said posts having bearings in which they readily reciprocate in the arms *o'' o''*, secured to one of the lower braces, *c*, and the cross-piece *o''*, secured to the under side of the central brace, *c'*.

The strings *n n* being strained over bridges located within the body of the instrument, it is impossible in tuning them to sound them by hand, and therefore great trouble would be experienced in tuning them unless some mechanical twanging device were devised for this purpose, which is accomplished by the tuning-rod *p*, having bearings in the inverted U-shaped bracket *p'*, secured to the under side of the brace *c'*, and also in one of the sides of said body through which one end of said rod *p* projects, and which is provided with a milled head, *p''*, by which said rod *p* may be moved lengthwise or oscillated in its bearings, as may be desired. Upon said rod *p*, between the downwardly-projecting arms of the bracket *p'*, is secured the picker-arm *p''*, which has its two sides curved to form a neck with a head at its end, which curved surfaces are covered with leather or similar material, as shown in Figs. 2 and 15, the normal position of which arm is as shown in Figs. 2 and 3; but when it is desired to tune the strings *n n*, and it is found necessary to twang said strings, the rod *p* is reciprocated in its bearings until the arm or finger *p''* is in a position above and a little to one side of the string which it is desired to twang. Said rod *p* is then oscillated in its bearings until the head at the end of said arm *p''* is below said string, when it should be reciprocated in its bearings until the said arm *p''* comes into contact with one side of the string,

at which time, if the rod p is suddenly oscillated in the opposite direction, so as to lift the outer end of arm p^3 , the head portion thereon will come into contact with the under side of the string, lift the same a short distance and then let go, thus causing the necessary twang, much in the same manner as it would be accomplished by the finger if said strings were accessible.

10 The arm p^3 is prevented from coming into engagement with the strings $n n$ when the instrument is in use by a suitable rod or arm, q , secured to the rod p , which is made to engage with a hook, q' , secured to the side of the bracket p' nearest to the head p^2 in such a manner that the arm p^3 cannot be moved downward or the rod p reciprocated in its bearings until said rod or arm q is again disengaged from the hook q' , all as shown in Figs. 2 and 3.

20 The neck B is provided with a rectangular projection, r , which fits into the opening r' , Fig. 10, made therefor in the stiffening-piece r^2 at the upper end of the body of the instrument, and to this is secured the round extension r^3 , the opposite end of which has a bearing in the stiffening-piece r^4 , at the lower end of said body, and to which it is secured by the screw l' , (which also secures the tail-piece C, as has been described,) the neck B being further secured to said body by the screw r^5 . This extension r^3 greatly increases the strength of the instrument, which is very desirable, especially in instruments of a large size.

Beneath the perforations $b b$ is placed a reverberant, E, which consists of a ring, s , over which is stretched a disk of very thin parchment or vellum, which is held in place by another but slightly-larger ring, s' , in a well-known manner, these rings $s s'$ being connected through the U-shaped support s^2 to the movable end of the spring-arm s^3 , the opposite end of which is secured to the bracket s^4 , mounted upon the inner side of the body of the instrument. As the strings $k k$ are touched by the musician, the heads A and A' are vibrated, and the air within the body of the instrument is set in motion, which in turn imparts its motion to the reverberant, which, as it vibrates in unison with the strings touched toward and from the upper head, A, acts as a regulator to gage the amount of sound to be emitted from the perforations $b b$.

The metal strip l , forming the upper portion of the bridge k' , is provided with suitable notches in its upper edge to receive the strings $k k$, in order to keep said strings an equal distance apart.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

60 1. A stringed musical instrument the body of which is provided with a parchment or vellum head perforated at or near the point where the strings are operated upon, with a cluster of circular openings to cause them to vibrate.

2. A stringed musical instrument the body of which is provided with two removable

heads, one of which is provided with a cluster of circular openings, and a series of strings within said body corresponding in number and pitch with the strings upon the outside of said instrument.

3. A stringed musical instrument the body of which is provided with a perforated vellum or parchment head and a reverberant mounted upon a spring or yielding arm, and located beneath the perforated portion of said head to regulate the amount of sound to be emitted therefrom.

4. In a musical instrument, the combination of two removable vellum or parchment heads, one or more headed rods or posts interposed between said heads and mounted in bearings, with their heads in contact with the front or upper head, and a spring interposed between the head of said rod and its bearing to maintain said rod in contact with said front or upper head.

5. A stringed musical instrument the body of which is provided with two vellum or parchment heads, a series of strings located within said body and corresponding in number and pitch with the strings outside of said body, and a series of pins interposed between said inside strings and one of the heads to transmit the vibrations of said head to said inside strings.

6. In a stringed musical instrument, a mute or damper consisting of a support covered with a non-resonant material pivoted to the bridge of the instrument and connected to a lever in such a manner that said support may be oscillated about its axis by said lever and brought into contact with the strings to deaden and soften their tone.

7. In a stringed musical instrument, a reverberant or sound-regulator consisting of a ring having clamped thereon a disk of thin parchment or vellum and mounted upon a spring-arm beneath the openings for the emission of the sound.

8. In a stringed musical instrument provided with a series of strings within the interior of the body thereof, a twanging device consisting of a rod mounted in suitable bearings in which it is adapted to be oscillated or reciprocated by means of a milled head located outside of said body, and having mounted thereon an arm provided with a cam portion by which any desired string may be snapped.

9. In a stringed musical instrument, the combination of the strings and the tail-piece thereof with a series of independent and detachable hooked wires interposed between said strings and said tail-piece.

10. In a stringed musical instrument, a series of strings secured in a fixed position to one of the ends of the body thereof, passing through said end into the interior of the body, where they are stretched over suitable bridges, and passing out at the opposite end to suitable tuning-pegs mounted in a suitable arm projecting from the lower end of the instrument.

11. In a stringed musical instrument, the combination of the sides $a a$, provided with

the slots $g' g'$, the vellum head A or A', the band f , the pull-downs $g g$, the bolts $g^2 g^2$, and the nuts $g^3 g^3$, all substantially as and for the purposes described.

5 12. In a stringed musical instrument, the combination of the sides $a a$, provided with the slots $g' g'$, the vellum head A or A', the metal band f , provided with the slots f', f^1 , and f^4 , and the stud or bolt f^2 , the bolts $g^2 g^2$,
10 the nuts f^3, g^3 , and g^3 , and a series of pull-downs, $g g$, all substantially as and for the purposes described.

13. In a stringed musical instrument, the combination of the sides $a a$, the vellum head A or A', the metal band f , provided with the slot f' at one end and the bolt f^2 at the other, and the nut f^3 , all substantially as and for the purposes described.

14. In a stringed musical instrument, the
20 combination of the vellum head A', the cross-brace c , the pins $n^1 n^1$, the vertically-moving bridges $n^3 n^3$, the springs $n^3 n^3$, and the strings $n n$, all substantially as and for the purposes described.

25 15. In a stringed musical instrument, the combination of the sides $a a$, provided with the stiffening-pieces r^2 and r^4 , the neck B, provided with the projection r , the extension r^3 , secured to said projection, and the screws l'

and r^5 , all substantially as and for the purposes 30 described.

16. In a stringed musical instrument, the combination of the sides $a a$, the vellum head A or A', and the series of longitudinal and cross-braces $c c$, all substantially as and for 35 the purposes described.

17. In a stringed musical instrument, the combination of a series of strings, $n n$, within the body thereof, the rod p , provided with the stop-rod q and the picker-arm p^3 , and mount- 40 ed in suitable bearings, so that it may be either oscillated or reciprocated therein, and the hook q' , secured to a fixed support, all substantially as and for the purposes described.

18. In a stringed musical instrument, a 45 bridge composed of a wooden base portion and a metal strip the upper edge of which is provided with suitable notches to receive the strings.

In testimony whereof I have signed my name 50 to this specification, in the presence of two subscribing witnesses, on this 1st day of September, A. D. 1885.

ROBERT F. FLEMMINGS, JR.

Witnesses:

WALTER E. LOMBARD,
FRANK E. BRAY.